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<b>(21) International Application Number:</b> PCT/EP99/03746 <b>(22) International Filing Date:</b> 29 May 1999 (29.05.99) <b>(30) Priority Data:</b> 98110433.4      8 June 1998 (08.06.98)      EP <b>(71) Applicant:</b> F. HOFFMANN-LA ROCHE AG [CH/CH]; 124 Grenzacherstrasse, CH-4070 Basel (CH). <b>(72) Inventor:</b> ZAHM, Friederike; Stattstrasse 18, D-79104 Freiburg (DE). <b>(74) Agent:</b> LOESCHNER, Thomas; 124 Grenzacherstrasse, CH-4070 Basel (CH).	<b>(81) Designated States:</b> AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	
<b>(54) Title:</b> USE OF PEG-IFN-ALPHA AND RIBAVIRIN FOR THE TREATMENT OF CHRONIC HEPATITIS C  <b>(57) Abstract</b>  The present invention provides the use of PEG-IFN- $\alpha$ conjugates in association with Ribavirin for the manufacture of medicaments for the treatment of chronic hepatitis C infections. The present invention also provides a method for treating chronic hepatitis C infections in patients in need of such treating comprising administering an amount of PEG-IFN- $\alpha$ conjugate in association with an amount of Ribavirin effective to treat hepatitis C.		

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Use of Peg-IFN-alpha and Ribavirin for the treatment of  
chronic hepatitis C

The present invention relates to the field of treatment of chronic hepatitis C infections using an amount of a PEG-IFN- $\alpha$  conjugate in association with Ribavirin effective to treat hepatitis C.

Interferons (IFNs) are naturally occurring proteins which have antiviral,  
5 antiproliferative and immunoregulatory activity. Four distinct classes of  
interferons are known to exist in humans (Pestka et al. (1987) Ann. Rev.  
Biochem. 56, 727-777 and Emanuel & Pestka (1993) J. Biol. Chem. 268,  
12565-12569). The IFN $\alpha$  family represents the predominant class of IFNs  
produced by stimulated peripheral blood leukocytes (Pestka et al., loc. cit.;  
10 Havell et al. (1975) Proc. Natl. Acad. Sci. USA 72, 2185-2187; Cavalieri et al.  
(1977) Proc. Natl. Acad. Sci. USA 74, 3287-3291), and lymphoblastoid and  
myeloblastoid cell lines (Familletti et al. (1981) Antimicrob. Agents.  
Chemother. 20, 5-9). The antiviral effect of IFN $\alpha$  is achieved not only by a  
direct influence on the viruses themselves, but by an activity on their target  
15 cells in the sense of a protection against the virus infection. The interferons  
can exert effects on cancer tumors and can influence the immune system of the  
body on that, for example, they activate macrophages and NK cells and  
intensify the expression of various immunologically significant constituents of  
the cell membrane. Details of the preparation of interferon-cDNA and the  
20 direct expression thereof, especially in *E. coli*, have been the subject of many  
publications. Thus, for example, the preparation of recombinant interferons is  
known, for example, from Nature 295 (1982), 503-508, Nature 284 (1980), 326-  
320, Nature 290 (1981), 20-26, Nucleic Acids Res. 8 (1980), 4057-4074, as well  
as from European Patents Nos. 32134, 43980 and 211148.

25 Combination therapy of IFN- $\alpha$  and Ribavirin in the treatment of chronic  
hepatitis C infections has been proposed (European Patent Application No.  
707855), however, this treatment is not always effective.

The combination therapy of PEG-IFN- $\alpha$  conjugates and Ribavirin may  
thus be more effective than combination therapy of IFN- $\alpha$  and Ribavirin.

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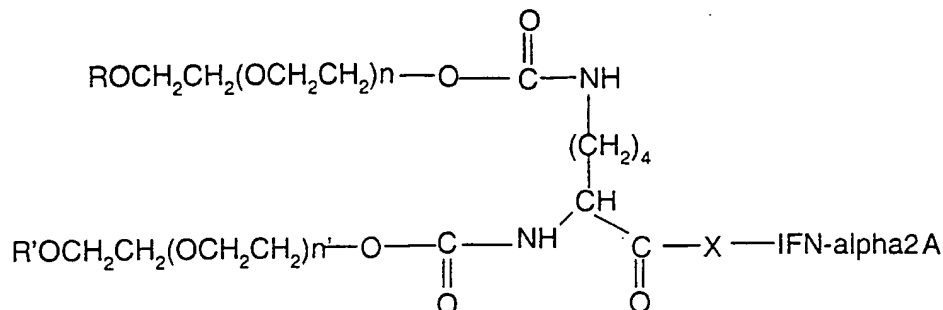
It has been observed that in the case of IFN- $\alpha$ , PEGylation increases circulating half-life and plasma residence time, reduces immunogenicity, decreases clearance and increases in vivo activity.

The present invention provides therefore the use of PEG-IFN- $\alpha$  conjugates in association with Ribavirin for the manufacture of medicaments for the treatment of chronic hepatitis C infections. In addition, the present invention provides a method for treating chronic hepatitis C infections in patients in need of such treating comprising administering an amount of PEG-IFN- $\alpha$  conjugate in association with an amount of Ribavirin effective to treat chronic hepatitis C.

The term "PEG-IFN- $\alpha$  conjugate" as used herein includes IFN- $\alpha$ s derived from any natural material (e.g., leukocytes, fibroblasts, lymphocytes) or material derived therefrom (e.g. cell lines), or those prepared with recombinant DNA technology. Details of the cloning of IFN $\alpha$  and the direct expression thereof, especially in *E. coli*, have been the subject of many publications. The preparation of recombinant IFN $\alpha$ s is known, for example from Goeddel et al. (1980) *Nature* 284, 316-320 and (1981), *Nature* 290, 20-26, and European Patents Nos. 32134, 43980 and 211148. There are many types of IFN $\alpha$  such as IFN $\alpha$ I, IFN $\alpha$ 2; and further their subtypes including but not limited to IFN $\alpha$ 2A, IFN $\alpha$ 2B, IFN $\alpha$ 2C and IFN $\alpha$ II (also designated IFN $\alpha$ II or  $\omega$ -IFN). The term "IFN $\alpha$ " also includes consensus IFN $\alpha$  available from Amgen or mixtures of natural and/or recombinant IFN $\alpha$ s. The use of IFN $\alpha$ 2A is preferred. The manufacture of IFN $\alpha$ 2A is described in European Patents Nos. 43980 and 211148.

The IFN- $\alpha$  is conjugated to a polymer such as a polyalkylene glycol (substituted or unsubstituted), for example, polyethylene glycol, to form PEG-IFN- $\alpha$  conjugate. Conjugation may be accomplished by means of various linkers known in the art, in particular by linkers such as those disclosed in European Patent Applications, Publication Nos. 0510356, 593868 and 809996. The molecular weight of the polymer, which is preferably polyethylene glycol, may range from 300 to 70.000 daltons, and one or more, preferably one to three, polymers may be conjugated to the IFN- $\alpha$ . A preferred PEG-IFN- $\alpha$  conjugate has the formula:

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where R and R' are methyl, X is NH, and n and n' are individually or both either 420 or 520.

Ribavirin, 1-β-D-Ribofuranosyl-1H-1,2,4-triazole-3-carboxamide, is  
 5 described in the Merck Index, compound No. 8199, Eleventh Edition. Its manufacture and formulation are described in U.S. Patent No. 4,211,771.

In accordance with this invention, PEG-IFN-α conjugate and Ribavirin are administered to the patient suffering from chronic hepatitis C infection in combined amounts effective to eliminate or at least alleviate one or more of the  
 10 signs or symptoms of chronic hepatitis C including elevated ALT, positive test for anti-HCV antibodies, presence of HCV as demonstrated by a positive test for HCV-RNA, clinical stigmata of chronic liver disease and hepatocellular damage.

The dosage of PEG-IFN-α conjugate for practicing the combination  
 15 therapy of this invention is about 33 to 540 microgram (mcg) per week, regardless of body weight, in one or two weekly administrations.

The dosage of Ribavirin for practicing this invention is about 400 to 1200 mg per day at least five days per week, preferably seven days per week. Based on the assumption of a patient weighing between 40 and 150 kg, the range of  
 20 dosing is therefore between 10 and 30 mg per kg body weight per day. In a more specific embodiment the daily dosage of Ribavirin is 800-1200 mg. This daily dosage may be administered once per day in a single dose or in divided doses twice or thrice per day. Preferably the daily dosage of Ribavirin is administered in divided doses twice per day.

25 In accordance with this invention, the Ribavirin is administered to the patient in association with PEG-IFN-α conjugate, that is, the PEG-IFN-α conjugate dose is administered during the same or different periods of time that the patient receives doses of Ribavirin. In an embodiment of this

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invention, at least one daily dose of Ribavirin is administered within the same week as at least one dose of PEG-IFN- $\alpha$ . In a more specific embodiment a majority of the Ribavirin administrations occur within the same week as one or more PEG-IFN- $\alpha$  administrations. In another specific embodiment, all or

5 substantially all of the Ribavirin administrations occur within the same week as one or more PEG-IFN- $\alpha$  administrations. At present PEG-IFN- $\alpha$  conjugate formulations are not effective when administered orally, so the preferred method of administering the PEG-IFN- $\alpha$  conjugate is parenterally, preferably by subcutaneous (sc) or intramuscular (im) injection. The Ribavirin may be

10 administered orally in capsule or tablet form in association with the parenteral administration of PEG-IFN- $\alpha$  conjugate. Of course other types of administration of both medicaments, as they become available are contemplated, such as by nasal spray, transdermally, by suppository, by sustained release dosage form, etc. Any form of administration will work so

15 long as the proper dosages are delivered without destroying the active ingredient.

The effectiveness of treatment may be determined by controlled clinical trials of the combination therapy versus monotherapy and / or combination therapy of IFN- $\alpha$  and Ribavirin. The efficacy of the combination therapy in

20 alleviating the signs and symptoms of chronic hepatitis C infection and the frequency and severity of the side effects will be compared with previous IFN- $\alpha$  monotherapy and / or combination therapy of IFN- $\alpha$  and Ribavirin. Three populations suffering from chronic hepatitis C infection are of relevance for evaluation. Either only one or all three patient populations will be studied

25 with the combination:

1. Patients previously untreated.
  2. Patients previously treated with IFN- $\alpha$  and / or Ribavirin or any other drug and who had subsequently relapsed.
  3. Patients who were non-responsive to previous treatment with IFN- $\alpha$
- 30 and / or Ribavirin or any other drug.

The effectiveness of the combination therapy will be determined by the extent to which the previously described signs and symptoms of chronic hepatitis are alleviated.

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Example

A Phase III, Randomized, Multicenterr, Efficacy and Safety Study  
Comparing the Combination of Pegylated-Interferon  $\alpha$ 2A and Ribavirin to  
REBETRON™ in the Treatment of Patients with Chronic HCV Infection  
5 (CHC).

The primary purpose of this study is to compare the efficacy and safety of the combination of PEG-IFN- $\alpha$ 2A and Ribavirin with REBETRON [Intron A + Rebetol (Schering /ICN brand of Ribavirin)] in the treatment of CHC. Equal numbers of patients (330 patients) are receiving either the combination of  
10 PEG-IFN- $\alpha$ 2A and Ribavirin or REBETRON for 48 weeks. A third group of patients (165 patients) is receiving PEG-IFN- $\alpha$ 2A plus placebo for 48 weeks. The monotherapy arm provides a safety and efficacy comparator for the PEG-IFN- $\alpha$ 2A combination arm.

The dose of Intron A is 3 Mio. in 0.5 ml solution, administered  
15 subcutaneous (sc) three times per week (tiw) for 48 weeks.

The dose of PEG-IFN- $\alpha$ 2A is 180  $\mu$ g, administered sc once per week, in combination with Ribavirin or placebo for 48 weeks.

The dose of Ribavirin and Rebetol is 1000 mg or 1200 mg based upon body weight, per day in split doses. Patients weighing < 75 kg (165 lbs) receive  
20 1000 mg per day (400 mg in the morning and 600 mg in the evening), whereas patients weighing  $\geq$  75 kg receive 1200 mg per day (600 mg in the morning and 600 mg in the evening).

The primary efficacy parameters are the combined sustained virological [i.e., non-detectable HCV-RNA as measured by the AMPLICORTM PCR assay  
25 (sensitivity  $\geq$  100 copies/ml)] and biochemical (normalization of serum ALT concentration) responses at the conclusion of the untreated follow-up period. To be considered a responder, patients must have a normal serum alanine aminotransferase (ALT) activity at both weeks 68 and 72 and no detectable virus at week 72.

30 Safety assessments are performed during screening, at baseline, at weeks 1, 2, 4, 6 and 8 and then every 4 weeks thereafter throughout the 48 week treatment period. Safety assessment continues during the subsequent 24-week follow-up period. Measures of safety include adverse events, vital signs, and

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laboratory tests as well as tabulations of dose adjustments and premature withdrawals from treatment for safety or tolerability reasons.

Male and female patients aged 18 years or older with CHC who have not previously been treated with any form of IFN- $\alpha$ 2A or Ribavirin constitute the patient population. Patients must have quantifiable HCV-RNA, persistently abnormal ALT and liver biopsy within 12 months consistent with CHC. Patients with other forms of liver disease, anemia, human immunodeficiency virus (HIV) infection, hepatocellular carcinoma, pre-existing severe depression or other psychiatric disease, cardiac disease, renal disease, seizure disorders, or severe retinopathy are excluded.

A screening period (time from the first screening assessment to the first administration of test drug) of up to 35 days precedes treatment portion of the trial (48 weeks). Patients meeting all eligibility criteria are randomized to one of the three treatment regimens.

Patients in all groups who do not demonstrate a week 12 response [defined as either a decrease of at least one (1) log<sub>10</sub> unit in their HCV-RNA titer, as compared to baseline, or at least a 50% decrease (or normalization) of their serum ALT, as compared to baseline] are discontinued from therapy and considered non-responders. Patients meeting the week 12 definition of response are discontinued from treatment at week 24 if they do not demonstrate either non-detectable HCV-RNA (<100 copies/ml) or normalization of ALT. Patients discontinued from treatment are followed thereafter only for safety. All patients meeting the weeks 12 and 24 response criteria are treated for 48 weeks. The primary efficacy parameter is the combined virological and biochemical response (HCV-RNA <100 copies/mL and ALT normalization) at the end of the treatment-free follow-up period (24 weeks).

The currently known sustained virological response rates for the combination therapy of Intron A plus Rebetol and estimates of sustained virological response rates for PEG-IFN- $\alpha$ 2A monotherapy for 48 weeks (based upon data obtained from the phase II study), and PEG-IFN- $\alpha$ 2A plus Ribavirin are summarized below:



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<b>Known and Estimated Virological Response Rates</b>							
Treatment Group	Treatment Duration	Genotype 1 (A & B) EOT	Genotype 1 (A & B) EOF	Genotype non-1 EOT	Genotype non-1 EOF	Pooled EOT	Pooled EOF
N (Proportion of Total)		2/3		1/3		1/1	
Intron A	48 wks		9%		31%	29%	16%
Intron A plus Rebetol	48 wks		29%		65%	51%	41%
PEG-IFN	48 wks	60%	(29%)*	70%	(60%)*	62%	(40%)*
PEG-IFN plus Ribavirin	48 wks	(61%)*	(46%)*	70%	(70%)*	(66%)*	(53%)*

\*: Percent in parentheses are response rates estimated based on known response rates shown in the remainder of the table.

EOT: End-of-treatment virological response rate (clearance of virus).

5

EOF: End-of-follow-up virological response rate (clearance of virus).

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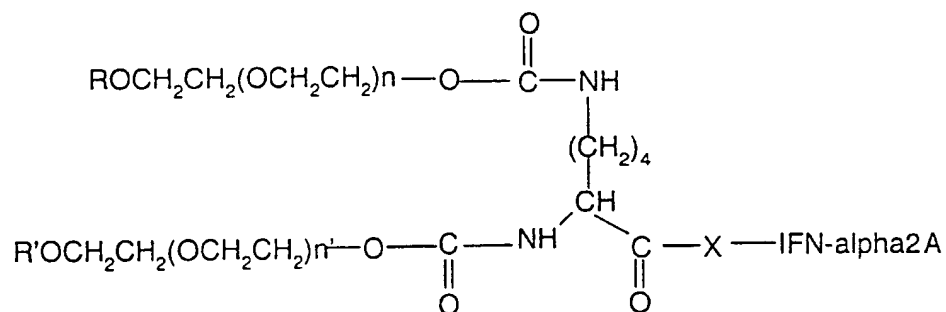
Claims

1. The use of PEG-IFN- $\alpha$  conjugates in association with Ribavirin for the manufacture of a medicament for the treatment of chronic hepatitis C infections.

5 2. Use according to claim 1 wherein the amount of the PEG-IFN- $\alpha$  conjugate is about 33 to 540 mcg per week.

3. Use according to claim 1 wherein the amount of Ribavirin is 400 to 1200 mg daily.

4. Use according to claims 1 to 3 wherein the PEG-IFN- $\alpha$  conjugate is  
10 PEG-IFN- $\alpha$ 2A conjugate having the formula:



where R and R' are methyl, X is NH, and n and n' are individually or both either 420 or 520.

5. A method for treating chronic hepatitis C infections comprising  
15 administering an amount of PEG-IFN- $\alpha$  conjugate in association with an amount of Ribavirin effective to treat chronic hepatitis C.

6. The method according to claim 5 wherein the amount of PEG-IFN- $\alpha$  conjugate administered in said method is about 33 to 540 mcg per week.

7. The method according to claim 5 wherein the amount of Ribavirin  
20 administered in said method is 400 to 1200 mg daily.

8. The method of any of claims 5 to 7 wherein the PEG-IFN- $\alpha$  conjugate administered is PEG-IFN- $\alpha$  2A conjugate as defined above.

9. Use of a PEG-IFN- $\alpha$  conjugate and Ribavirin for the treatment of chronic hepatitis C infections.

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10. The invention as hereinbefore described.

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/EP 99/03746

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61K31/70 A61K38/21 A61K47/48 //(A61K38/21,31:70)

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61K

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Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 707 855 A (SCHERING CORP) 24 April 1996 (1996-04-24) cited in the application claims ----	1-10
Y	WO 97 16204 A (SCHERING CORP) 9 May 1997 (1997-05-09) claims ----	1-10
Y	WO 95 13090 A (ENZON INC) 18 May 1995 (1995-05-18) page 17, line 35 - page 18, line 10 page 3, line 30 - line 33 ----- -/--	1-10

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 593 868 A (HOFFMANN LA ROCHE) 27 April 1994 (1994-04-27) cited in the application page 6, line 14 - line 29 page 10, line 6 - line 12; claims ---	1-10
Y	EP 0 510 356 A (HOFFMANN LA ROCHE) 28 October 1992 (1992-10-28) cited in the application page 15, line 47 - line 53 examples 8A, 9, 10, 15, 16, 17, 20, 21, 22, 24 ---	1-10
P, Y	WO 98 48840 A (SCHERING CORP) 5 November 1998 (1998-11-05) claims -----	1-10

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/03746

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0707855 A	24-04-1996	AU 5919296 A	29-11-1996
		BR 9608758 A	06-07-1999
		CA 2221314 A	21-11-1996
		CN 1190895 A	19-08-1998
		CZ 9703654 A	15-07-1998
		HU 9802324 A	28-05-1999
		JP 10506640 T	30-06-1998
		NO 975309 A	19-11-1997
		PL 323477 A	30-03-1998
		SK 155997 A	07-10-1998
		WO 9636351 A	21-11-1996
WO 9716204 A	09-05-1997	AU 7473096 A	22-05-1997
		CA 2236591 A	09-05-1997
		EP 0858343 A	19-08-1998
		US 5908621 A	01-06-1999
WO 9513090 A	18-05-1995	AU 691225 B	14-05-1998
		AU 1179895 A	29-05-1995
		EP 0730470 A	11-09-1996
		HU 75533 A	28-05-1997
		JP 9506087 T	17-06-1997
		NZ 276943 A	26-02-1998
		US 5711944 A	27-01-1998
		US 5951974 A	14-09-1999
EP 0593868 A	27-04-1994	US 5382657 A	17-01-1995
		AT 165102 T	15-05-1998
		AU 668742 B	16-05-1996
		AU 4478093 A	03-03-1994
		BG 98067 A	15-11-1994
		BR 9303469 A	22-03-1994
		CA 2103829 A	27-02-1994
		CN 1088936 A, B	06-07-1994
		CN 1211578 A	24-03-1999
		CN 1173500 A	18-02-1998
		CZ 9301693 A	13-04-1994
		DE 69317979 D	20-05-1998
		DE 69317979 T	20-08-1998
		ES 2116376 T	16-07-1998
		FI 933740 A	27-02-1994
		HR 931094 A	30-06-1997
		HU 67013 A	30-01-1995
		JP 2859105 B	17-02-1999
		JP 6192300 A	12-07-1994
		LT 3174 B	27-02-1995
		LV 10907 A	20-12-1995
		LV 10907 B	20-04-1996
		MW 7693 A	08-06-1994
		MX 9305146 A	31-03-1994
		NZ 248452 A	21-12-1995
		NZ 264872 A	26-01-1996
		OA 9850 A	15-08-1994
		PL 300194 A	05-04-1994
		SI 9300423 A	31-03-1994
		SK 89893 A	06-04-1994
		ZA 9306098 A	01-03-1994
		ZW 11193 A	23-03-1994

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 99/03746

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0510356 A	28-10-1992	US 5595732 A	21-01-1997
		AT 176159 T	15-02-1999
		AU 657311 B	09-03-1995
		AU 1316092 A	01-10-1992
		AU 671045 B	08-08-1996
		AU 7761594 A	12-01-1995
		BG 60800 B	29-03-1996
		CA 2063886 A	26-09-1992
		CN 1065465 A, B	21-10-1992
		CN 1175465 A	11-03-1998
		CS 9200871 A	14-10-1992
		DE 69228269 D	11-03-1999
		DE 69228269 T	08-07-1999
		ES 2128329 T	16-05-1999
		FI 921267 A	26-09-1992
		GR 3030049 T	30-07-1999
		HU 9500259 A	28-09-1995
		JP 2637010 B	06-08-1997
		JP 5117300 A	14-05-1993
		MW 1892 A	12-01-1994
		MX 9201298 A	01-10-1992
		NZ 242084 A	23-12-1993
		NZ 248022 A	23-12-1993
		OA 9760 A	30-11-1993
		RO 109543 A	30-03-1995
		SI 9210294 A	31-10-1995
		US 5849860 A	15-12-1998
		US 5539063 A	23-07-1996
		US 5792834 A	11-08-1998
		US 5559213 A	24-09-1996
		US 5747646 A	05-05-1998
		US 5834594 A	10-11-1997
		ZW 4392 A	23-09-1992
WO 9848840 A	05-11-1998	US 5908621 A	01-06-1999
		AU 7249098 A	24-11-1998